Code: 13A04301

R13

B.Tech II Year I Semester (R13) Regular Examinations December 2014

ELECTRONIC DEVICES & CIRCUITS

(Common to EEE, ECE and EIE)

Time: 3 hours Max. Marks: 70

PART - A

(Compulsory Question)

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1 Answer the following: (10 X 02 = 20 Marks)

(a) Define forbidden energy gap.
(b) Define peak inverse voltage of diode.
(c) When does a transistor act as a switch?
(d) Define transconductance.
(e) What is operating point?
(f) Which is the most commonly used transistor configuration. Why?
(g) Write the voltage and current equation for hybrid parameters.
(h) What is the significance of h-parameters?
(i) What are the limitations of LCD?
(j) Define radiant intensity for LED.

PART - B

(Answer all five units, 5 X 10 = 50 Marks)

UNIT - I

2 (a) Derive the diode current equation?
(b) Describe the physical mechanism for avalanche breakdown.

OR

3 Derive the ripple factor and efficiency for full wave rectifier with input capacitance.

UNIT - II

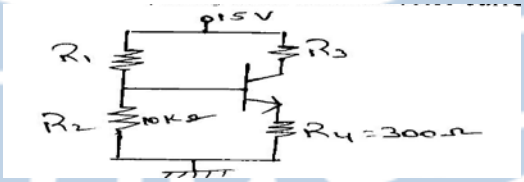
4 With the help of a neat diagram show different current components in a transistor.

OR

5 Draw and explain the drain characteristics of N-channel Enhancement type MOSFET.

UNIT - III

6 In the circuit show in figure transistor has β = 100 and $V_{BE\ (active)}$ = 0.6 V. Calculate the values of R_1 & R_3 Such that collector current of 1 mA and V_{CE} = 2.5 V.



OR

7 For the improvement of stability of the operating point what suggestions you would like to give for self-bias. Discuss with the help of stability factors.

UNIT - IV

8 (a) State Miller's theorem with the aid of a circuit diagram.
(b) Explain the dual of Miller's theorem.

OR

9 Given I_E = 2.5 mA, h_{fe} = 140, h_{oe} = 20 μs and h_{ob} = 0.5 μs determine:
(a) The common- emitter hybrid equivalent circuit.
(b) The common base r_e model.

UNIT - V

10 Sketch and explain the volt-ampere characteristics of a tunnel diode. Indicate the negative resistance portion.

OR

11 (a) Explain the construction and working of photo diode.
(b) Explain Schottky diode with necessary sketches.

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